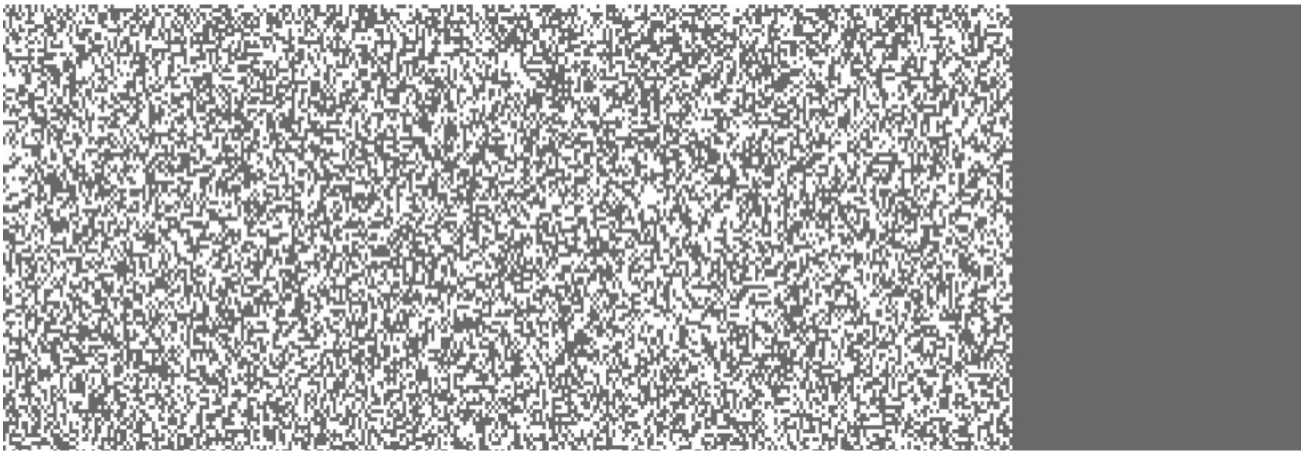
Help Center

Inter-page shifts

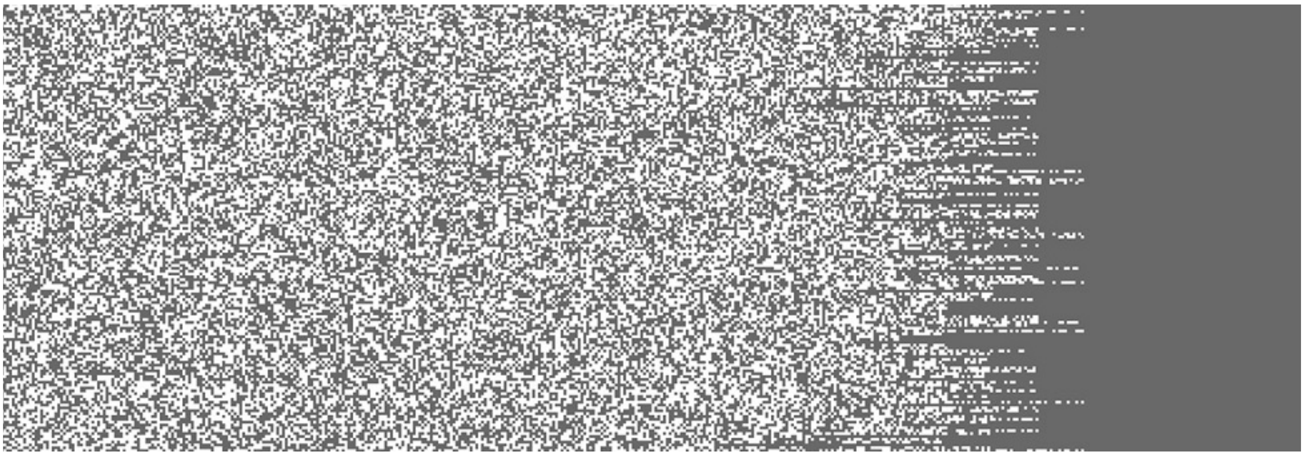
Inter-page shifts

The shifted pages during memory chip reading isn’t a regular situation, but sometimes in some cases with specific devices, this problem may appear. In this article, we will show you why exactly this problem occurs and how to easily fix it in VNR.

Good looking page ending.



Bad-looking page ending.

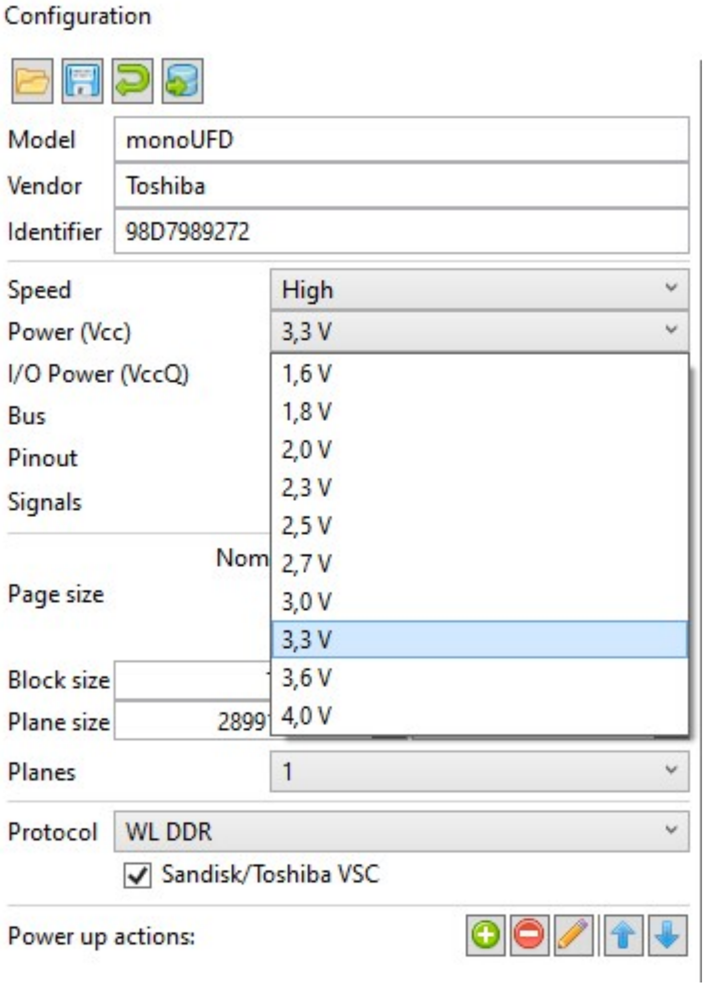


There are several issues that lead to this problem:

1. Wrong voltage.

Fix:

First of all, you need to check the influence of voltage levels by increasing/decreasing VCC and VCCQ that the reader supplies to the device. This is the first step that will help to solve most of these problems.

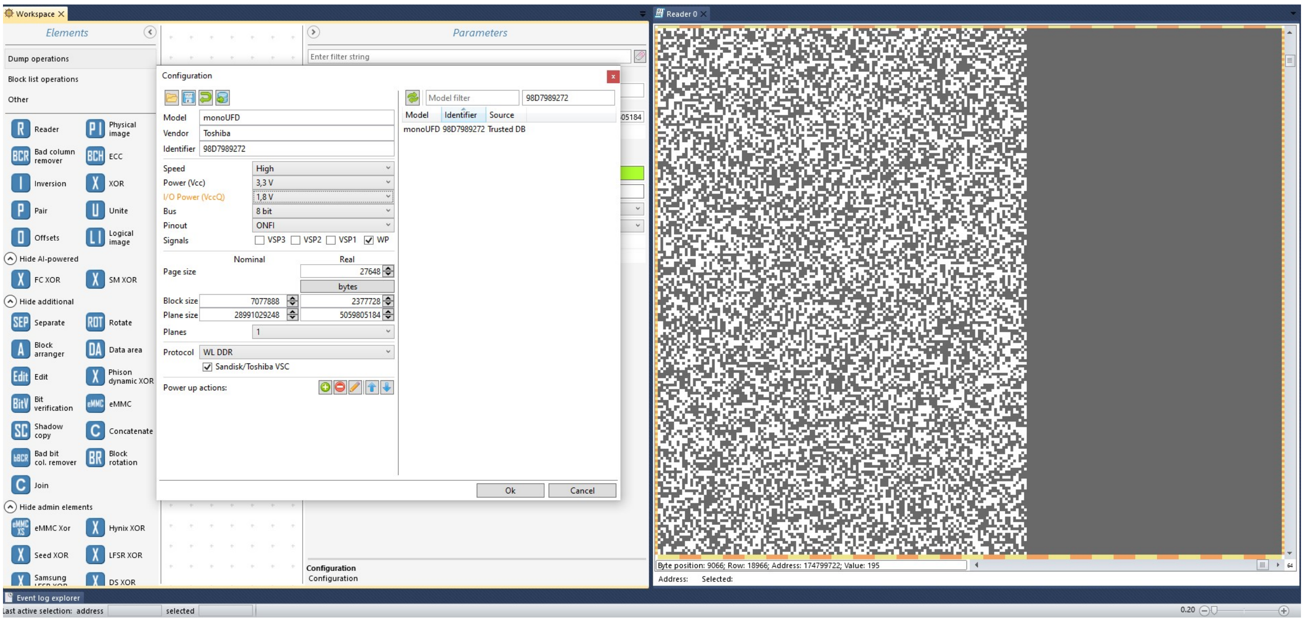


Configuration

Model: monoUFD
Vendor: Toshiba
Identifier: 98D7989272
Speed: High
Power (Vcc): 3,3 V
Planes: 1
Protocol: WL DDR
☑ Sandisk/Toshiba VSC

I/O Power (VccQ)
Bus
Pinout
Signals
Nom
Page size
Block size
Plane size
2899
1,6 V
1,8 V
2,0 V
2,3 V
2,5 V
2,7 V
3,0 V
3,3 V
3,6 V
4,0 V
Power up actions:

The influence of the voltage can be easily checked in live mode by opening the dump on the reader element. It allows to see the real impact which particular voltage level has on the NAND chip.


Workspace
Elements
Dump operations
Block list operations
Other
Reader
Physical image
Bad column remover
ECC
Inversion
XOR
Pair
Unite
Offsets
Logical image
Hide AI-powered
FC XOR
SM XOR
Hide additional
Separate
Rotate
Block arranger
Data area
Edit
Phison dynamic XOR
Bit verification
eMMC
Shadow copy
Concatenate
Bad bit col. remover
Block rotation
Join
Hide admin elements
eMMC Xor
Hynix XOR
Seed XOR
LFSR XOR
Samsung
DS XOR
Parameters
Enter filter string
Reader 0
Event log explorer
Last active selection: address
selected
0.20

Configuration

Model filter: 98D7989272

Model	Identifier	Source
monoUFD	98D7989272	Trusted DB

Model: monoUFD
Vendor: Toshiba
Identifier: 98D7989272
Speed: High
Power (Vcc): 3,3 V
I/O Power (VccQ): 1,8 V
Bus: 8 bit
Pinout: ONFI
Signals: ☐ VSP3 ☐ VSP2 ☐ VSP1 ☑ WP

	Nominal	Real
Page size		27648 bytes
Block size	7077888	2377728
Plane size	28991029248	5059805184

Planes: 1
Protocol: WL DDR
☑ Sandisk/Toshiba VSC
Power up actions:

Ok Cancel

Configuration
Configuration

Byte position: 9066; Row: 18966; Address: 174799722; Value: 195
Address: Selected:

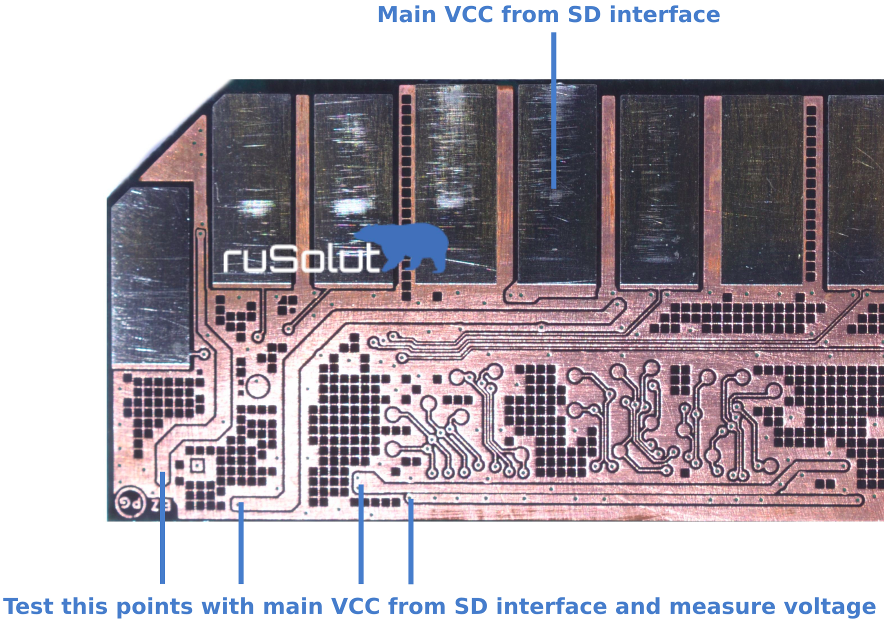
2. Lack of power

Fix:

Find an additional power (VCCQ) on the device and connect it to the adapter.

To find the additional power, you should:

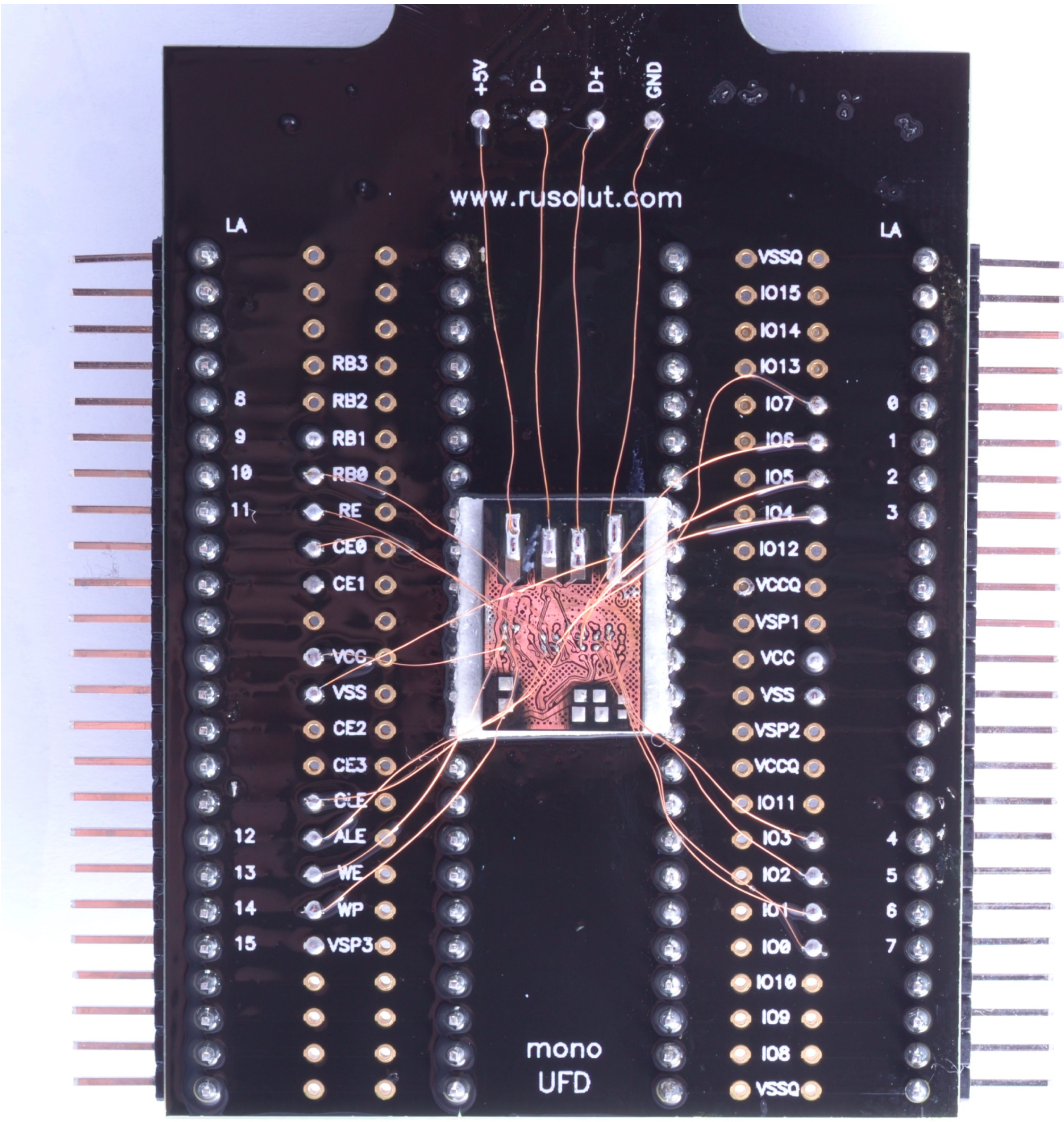
- Connect the SD interface to the PCB and insert it into the card reader, thereby supplying power to the whole device.
- Then you need to find the wide tracks on the NAND interface and test continuity with the main power (VCC) of the SD interface. If the tracks are bridged, it means that these are the main power tracks, we are not interested in it. On other wide tracks that are not connected to the main SD power supply, you need to measure the voltage (black probe to the ground, red to the track). The VccQ auxiliary power should be between 1.8 and 3.3 volts. Tracks in which the power will be below 1.8 belong to controller's circuit and we are not interested in it.


Main VCC from SD interface
ruSolut
Test this points with main VCC from SD interface and measure voltage

3. Wire length

Fix:
The length of the wires from the device to the PCB should be as short as possible. Unnecessary wires should be removed from the NAND interface.
In general, the long wires are bad for signal quality (synchronization/delay). The longer the wire is, the more it interfere with other signals.
Additional unnecessary wires also badly affect the quality of the dump.

Below is an example of a photo with a proper soldering and length of wires.

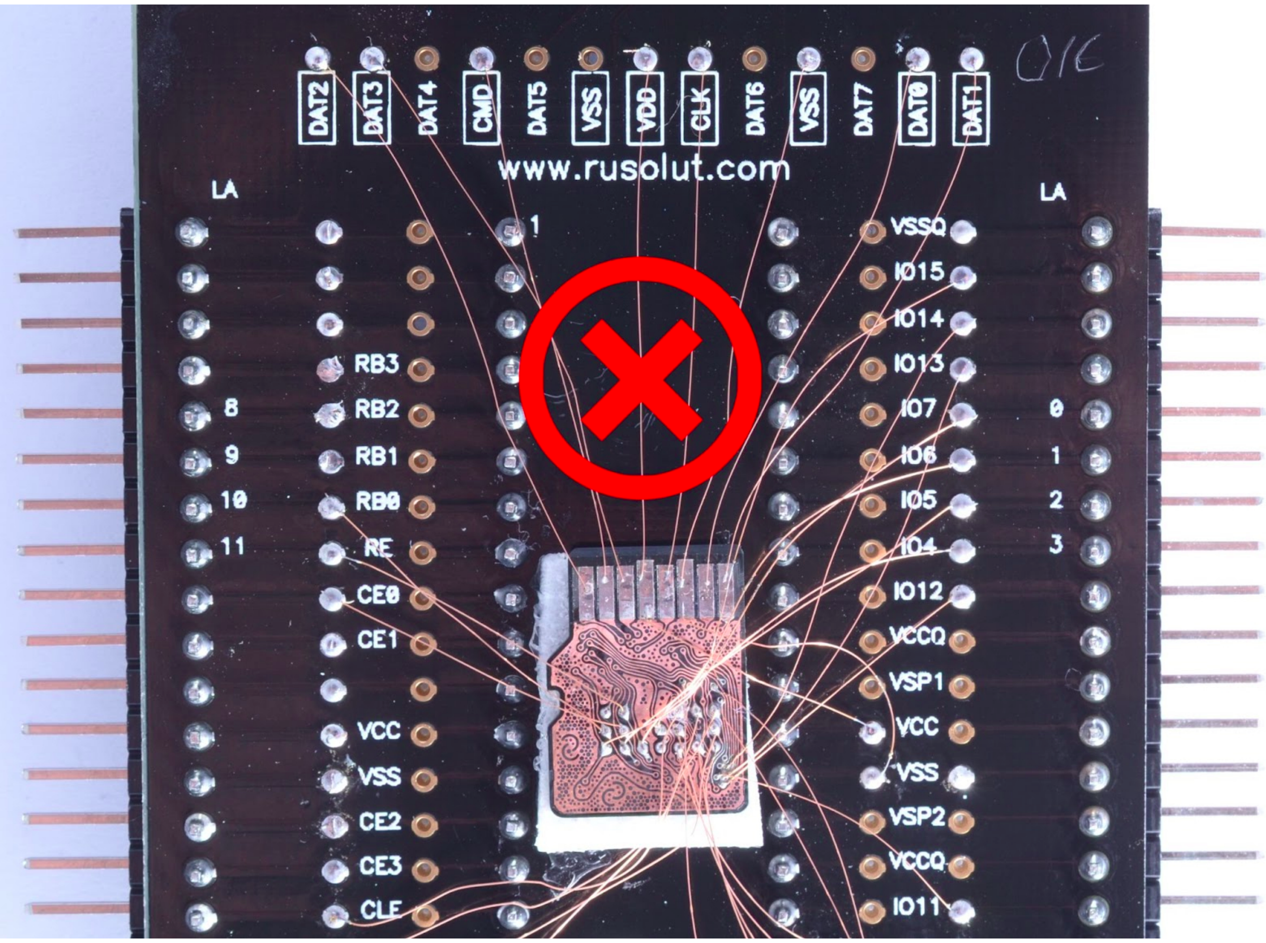

+5V
D-
D+
GND
www.rusolut.com
LA
LA
RB3
RB2
RB1
RB0
RE
CE0
CE1
VCC
VSS
CE2
CE3
CLE
ALE
WE
WP
VSP3
8
9
10
11
12
13
14
15
VSSQ
IO15
IO14
IO13
IO7
IO6
IO5
IO4
IO12
VCCQ
VSP1
VCC
VSS
VSP2
VCCQ
IO11
IO3
IO2
IO1
IO0
IO10
IO9
IO8
VSSQ
0
1
2
3
4
5
6
7
mono
UFD

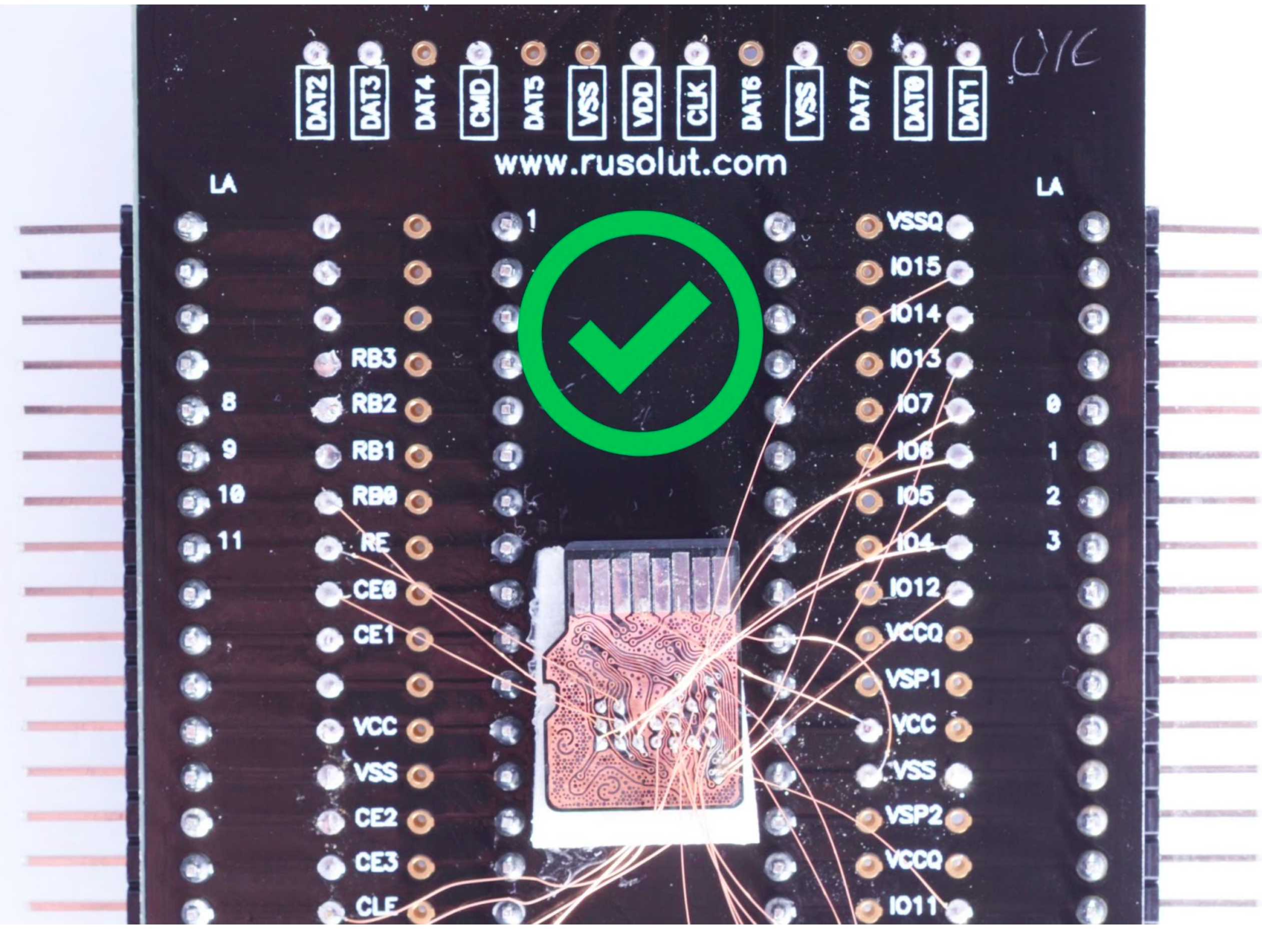
4. Excessive wiring.

Fix:

Disconnect all wires from the SD/USB interface of the device.

There are situations when all the previous advice did not help. In the last step, you need to unsolder the SD interface from the device and look again at the end of the dump page.


DAT2
DAT3
DAT4
CMD
DAT5
VSS
VDD
CLK
DAT6
VSS
DAT7
DAT0
DAT1
www.rusolut.com
LA
LA
1
RB3
RB2
RB1
RB0
RE
CE0
CE1
VCC
VSS
CE2
CE3
CLE
8
9
10
11
VSSQ
IO15
IO14
IO13
IO7
IO6
IO5
IO4
IO12
VCCQ
VSP1
VCC
VSS
VSP2
VCCQ
IO11
0
1
2
3


DAT2
DAT3
DAT4
CMD
DAT5
VSS
VDD
CLK
DAT6
VSS
DAT7
DAT0
DAT1
www.rusolut.com
LA
LA
1
RB3
RB2
RB1
RB0
RE
CE0
CE1
VCC
VSS
CE2
CE3
CLE
8
9
10
11
VSSQ
IO15
IO14
IO13
IO7
IO6
IO5
IO4
IO12
VCCQ
VSP1
VCC
VSS
VSP2
VCCQ
IO11
0
1
2
3

Summary

Paying attention to the most common things may save you a lot of time. Many of us, engineers, too often ignore basics, just because "we know stuff", "we do it for years and never got a problems", "it always worked like that", "soldering looks fine", etc...

Always check the basics!

https://support.rusolut.com/portal/en/kb/articles/inter-page-shifts-17-11-2021